

REMARKS

Reconsideration of the present application is respectfully requested. No claims have been amended, canceled or added.

Claims 1-28 stand rejected under 35 U.S.C. § 103(a) based on U.S. Patent no. 6,539,352 of Sharma et al. ("Sharma") in view of U.S. Patent no. 5,774,525 of Kanevsky et al. ("Kanevsky").

Applicants respectfully traverse the rejections.

The present invention relates to an integrated speaker and speech recognition system that provides improved speaker-specific response in a noisy environment. The invention uses the results of speaker verification in a novel and non-obvious way, i.e., to improve the quality of speech recognition.

For example, claim 23 recites:

23. (Currently amended) A method comprising:
receiving an utterance from an intended talker at a speech recognition system;
computing a speaker verification score based on a voice characteristic model associated and with the utterance;
computing a speech recognition score associated with the utterance;
and
selecting a best hypothesis from a plurality of hypotheses representing automatic speech recognition results of the utterance, based on both the speaker verification score and the speech recognition score.

(Emphasis added.)

First, one should note the difference between speech recognition and speaker verification. Speech recognition involves recognizing what the speaker is saying. Speaker verification, on the other hand, involves determining whether the speaker is who he claims to be. Sometimes speaker verification is called "speaker recognition" (e.g., as in Sharma), however, that is not the same as speech recognition. This distinction is well-understood by those skilled in the relevant art.

Sharma and Kanevsky both are primarily directed to speaker verification. Although Kanevsky employs speech recognition as part of the overall process, the method of performing speech recognition is not the focus of Kanevsky and is not described in detail. Hence, neither Sharma nor Kanevsky discloses or suggests using results of speaker verification to improve the accuracy of speech recognition, as the present invention does. More specifically with regard to claim 23, neither Sharma nor Kanevsky discloses or suggests selecting a best hypothesis from a plurality of hypotheses representing automatic speech recognition results of the utterance, based on both a speaker verification score and a speech recognition score.

The Examiner admits that Sharma fails to disclose selecting a best hypothesis from a plurality of hypotheses representing automatic speech recognition results of the second utterance, based on a combined based on both a speaker verification score and a speech recognition score (Final Office Action, p. 4). However, the Examiner contends that Kanevsky teaches such

functionality, and that it would be obvious to combine those teachings with those of Sharma to produce the present invention.

Applicant agrees with the Examiner's admission regarding what Sharma fails to disclose; however, Applicant respectfully submits that the Examiner has misread both Sharma and Kanevsky. Although Applicants arguments are directed to the alleged combination of references, it is necessary to consider their individual disclosures, in order to ascertain what combination, if any, could be made from them.

First, the Examiner incorrectly contends that Sharma discloses "computing a speech recognition score . . ." at col. 4, lines 28 (Final Office Action, p. 3). There is no disclosure of computing any speech recognition scores there or anywhere else in Sharma. Sharma does disclose computing certain scores, as follows:

The multiple classifiers of the enrollment component are used to 'score' the subword data, and the scores are fused, or combined. The result of the fusion is a "final score". The final score is compared to the stored threshold. If the final score exceeds the threshold, the test sample is verified as the user's. If the final score is less than the threshold, the test sample is declared not to be the user's. Sharma, col. 5, lines 10-17.

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In the preferred embodiment, a classifier fusion module 130 using the linear opinion pool method combines the NTN score and the GMM score. Col. 11, lines 43-45.

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The threshold value output 140 is compared to a ‘final score’ in the testing component to determine whether a test user’s voice has so closely matched the model that it can be said that the two voices are from the same person. Col. 12, lines 8-12.

From the above-quoted language, it is clear that the scores mentioned in Sharma merely indicate how closely segments of speech match a model of previously stored speech. Thus, these scores are, if anything, speaker verification scores, not speech recognition scores. If the Examiner nonetheless maintains that these scores are speech recognition scores, then they cannot also be the speaker verification scores recited Applicant’s claims.

Second, the Examiner contends:

Kanevsky et al. in the same field of endeavor do teach selecting a best hypothesis of the entered passwords and voice characteristics from a plurality of hypotheses representing automatic speech recognition results of the second utterance based on both the speaker verification score and the speech recognition score (necessarily disclosed within) the process of password verification and the voice verification of the authentication of system (col. 10, lines 24-27), using ASR system (col. 4, lines 59-64), wherein the system selects the best hypothesis of the entered passwords and voice characteristics, resulting from questioning the user and verifying the answers with the data stored, versus deselecting the hypothesis resulted [sic] from the matching the user’s voice with the stored voice characteristics in the system database). Final Office Action, p. 4 (emphasis added).

The Examiner is mistaken on this point also. There is absolutely no disclosure or suggestion in Kanevsky that the speech recognition result (e.g., the selected hypothesis) is based on any speaker verification score, nor is such an approach inherent or “necessarily disclosed in” Kanevsky. Furthermore, as to

the Examiner's citation of col. 4, lines 59-64 in Kanevsky, that section merely discloses that automatic speech recognition can be used to recognize a password, which is then provided as input to the verification system 34 (see col. 4, lines 24-26).

Therefore, the cited references fail to disclose or even suggest all of the limitations of claim 23, either individually or in combination. Furthermore, the present invention also could not be obvious based on Sharma and/or Kanevsky, because Sharma and Kanevsky are not directed toward solving the same problem as the invention recited in claim 23. Both Sharma and Kanevsky relate primarily to improving speaker verification, whereas the present invention improves the quality of speech recognition (by using results of speaker verification). As such, no combination of Sharma and/or Kanevsky could disclose or suggest computing a speaker verification score and a speech recognition score based on an utterance, and using both scores to select one of a plurality of hypotheses representing automatic speech recognition results of the utterance as a best hypothesis. Therefore, claim 23 is patentable over the cited art.

Each of the other independent claims in the present application also includes limitations similar to those discussed above regarding claim 23. Therefore, all of Applicant's claims are patentable over the cited art, for at least these reasons.

Dependent Claims

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

Conclusion

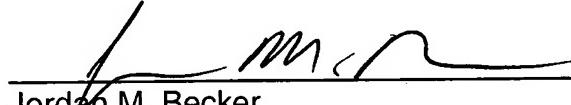
For the foregoing reasons, the present application is believed to be in condition for allowance, and such action is earnestly requested.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,
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Dated:

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